

AMENDMENTS TO THE CLAIMS

Claims 1-8 (Canceled)

9. A signal transmission apparatus comprising:

a modulator operable to assign a data stream of layer A and a data stream of layer B to a respective constellation in a signal space to produce a modulated signal of layer A and a modulated signal of layer B,

an inverse Fast Fourier Transformer operable to convert said modulated signal of layer A and said modulated signal of layer B into a transmission signal in layer A on a time axis and a transmission signal in layer B on a time axis respectively, wherein each transmission signal comprises an effective symbol signal and a guard interval signal,

a transmitter operable to transmit said transmission signals, and

wherein the period of said effective symbol signal in layer A is larger than the period of said effective symbol signal in layer B.

10. A signal transmission apparatus according to claim 9, wherein a source divides into said data stream of layer A and said data stream of layer B.

11. A signal receiving apparatus comprising:

a modulation signal in layer A, and

a modulation signal in layer B,

a Fast Fourier Transformer operable to convert said modulation signal in layer A and said modulation signal in layer B into a converted signal on a frequency axis in layer A and a converted signal on a frequency axis in layer B,

a demodulator operable to demodulate said converted signal in layer A and said converted signal in layer B into a data stream of layer A and a data stream of layer B, and

wherein the period of said effective symbol signal in layer A is larger than the period of said effective symbol signal in layer B.

12. A signal transmission system comprising a signal transmission apparatus and a signal receiving apparatus,

 said signal transmission apparatus comprising;

 a modulator operable to assign a data stream of layer A and a data stream of layer B to a respective constellation in a signal space to produce a modulated signal of layer A and a modulated signal of layer B,

 an inverse Fast Fourier Transformer operable to convert said modulated signal of layer A and said modulated signal of layer B into a transmission signal in layer A on a time axis and a transmission signal in layer B on a time axis respectively, wherein each transmission signal comprises an effective symbol signal and a guard interval signal, and

 a transmitter operable to transmit said transmission signal in layer A and said transmission signal in layer B, and

 said signal receiving apparatus comprising;

 a Fast Fourier Transformer operable to convert said transmission signal in layer A and said transmission signal in layer B into a converted signal on a frequency axis in layer A and a converted signal on a frequency axis in layer B,

 a demodulator operable to demodulate said converted signal in layer A and said converted signal in layer B into a data stream of layer A and a data stream of layer B, and

 wherein the period of said effective symbol signal in layer A is larger than the period of said effective symbol signal in layer B.

13. A signal transmission system according to claim 12, wherein a source divides into said data stream of layer A and said data stream of layer B.

14. A signal transmission method comprising:

 assigning a data stream of layer A and a data stream of layer B to a respective constellation in a signal space to produce a modulated signal of layer A and a modulated signal of layer B,

converting said modulated signal of layer A and said modulated signal of layer B into an IFFT converted signal in layer A on a time axis and an IFFT converted signal in layer B on a time axis respectively, wherein each IFFT converted signal comprises an effective symbol signal and a guard interval signal,

transmitting said IFFT converted signals, and

wherein the period of said effective symbol signal in layer A is larger than the period of said effective symbol signal in layer B.

15. A signal transmission method according to claim 14, wherein a source divides into said data stream of layer A and said data stream of layer B.

16. A signal receiving method comprising:

a modulation signal in layer A, and

a modulation signal in layer B,

converting said modulation signal in layer A and said modulation signal in layer B into a FFT converted signal on a frequency axis in layer A and a FFT converted signal on a frequency axis in layer B,

demodulating said FFT converted signal in layer A and said FFT converted signal in layer B into a data stream of layer A and a data stream of layer B, and

wherein the period of said effective symbol signal in layer A is larger than the period of said effective symbol signal in layer B.

17. A signal transmission and receiving method comprising a signal transmission method and a signal receiving method,

said signal transmission method comprising;

assigning a data stream of layer A and a data stream of layer B to a respective constellation in a signal space to produce a modulated signal of layer A and a modulated signal of layer B,

converting said modulated signal of layer A and said modulated signal of layer B into an IFFT converted signal in layer A on a time axis and an IFFT converted signal in layer B on a time axis respectively, wherein each transmission signal comprises an effective symbol signal and a guard interval signal, and

transmitting said IFFT converted signal in layer A and said IFFT converted signal in layer B, and

 said signal receiving apparatus comprising;

 converting said IFFT converted signal in layer A and said IFFT converted signal in layer B into a FFT converted signal on a frequency axis in layer A and a FFT converted signal on a frequency axis in layer B,

 demodulating said FFT converted signal in layer A and said FFT converted signal in layer B into a data stream of layer A and a data stream of layer B, and

 wherein the period of said effective symbol signal in layer A is larger than the period of said effective symbol signal in layer B.

18. A signal transmission method according to claim 17, wherein a source divides into said data stream of layer A and said data stream of layer B.